

On the Moths of the Family Urapterygidæ in the Collection of the British Museum. By ARTHUR G. BUTLER, F.L.S., F.Z.S.

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(PLATE IX.)

THE family of Geometrites founded by Guénée under this name can only arbitrarily be separated from the Ennomidæ. Dr. Packard says:—"The fact that genera so closely allied as *Drepanodes* and *Eutrapela* are placed separately in the families 'Ennomidæ' and 'Urapterygidæ' by M. Guénée, seems to me a proof that the groups are artificial ones and should be united."

No true Urapterygidæ have hitherto been found in the United States, and very few even in the New World; those few also appear to be so closely allied to some genera of Ennomidæ that only an arbitrary division of the two families can be maintained. On the other hand, if we follow Dr. Packard in uniting the two families, there is no knowing where to stop; inasmuch as the structure of the Urapterygidæ is repeated with slight modifications throughout the tribe. Thus, in the Palyadæ, *Byssodes appropriata* chiefly differs from the typical *Charodes* of Guénée in the imperfect closing of its wing-cells, though its style of ornamentation widely differs. The angular-winged subcaudate Microniidæ, on the contrary, although extremely like *Urapteryx* both in form and coloration, are absolutely dissimilar in the arrangement of their wing-veins, so that they ought not to be associated.

In the generic division of the Geometrites, although neuration must be considered of the highest importance, it is nevertheless impossible to ignore the characters offered by the different forms of the wings, each accurately repeated in series of allied species.

In Guénée's description of *Urapteryx* (translated by Walker) no attention is paid to neuration; but Guénée, although he evidently regarded structure as correlated with pattern and coloration, did nevertheless give *one plate*, chiefly of neuration, as illustrative of the tribe. Walker, however, ought to have made some attempt to describe the wing-structure, as he not unfrequently did in the case of new genera.

I regard the method of description adopted on the Continent as extremely undesirable, viz. where to save the trouble of

learning the names of the veins, numbers are given to them. It is popular because easy to learn; but is subject under unfavourable conditions to total failure; for, although most Lepidopterists have now adopted my method of using benzine in the examination of wing-veins*, cases may occur where by overlooking the forking of a vein the identity of every other vein in the wing is altered.

The number-system is essentially a retrograde movement. I need only refer to Von Heinemann's 'Schmetterlinge Deutschlands,' p. 6, where the veins are positively numbered from the back forwards, from the inner to the front margin. If the authors of the system in question are consistent they are utterly opposed to me in every thing; what I call the front legs are their hind legs, and the club of the antenna, where it exists, must be the last thing to describe. When I first began to describe genera, and found that Doubleday had numbered the three branches of the median vein backwards, I thought the error sufficiently grave, and I carefully avoided repeating it†; but by what argument the costal margin of a wing can be regarded as posterior and the inner margin anterior (excepting with certain Moths in repose upon a perpendicular surface) I must confess myself utterly unable to understand. In speaking of a branched vein like the median, it is in accordance with common sense to call the first branch emitted the first and not the third; therefore in this vein the branches have to be counted upwards; but this is no excuse for counting the last emitted branch of the subcostal vein as first. I hold, then, that the number-system, although easy to learn, is unreasonable and (excepting when employed by very careful observers) worse than useless.

Synoptical Diagnoses of the Genera of Urapterygidæ.

A. Primaries triangular, the outer margin not angulated.

1. Secondaries caudate, or angulated at the extremity of the third median branch; subcostal vein of primaries 4-branched; first branch emitted before the end of the cell and united to the costal vein beyond the end.

a. Subcostal branches of secondaries emitted almost from the same point; second and third median branches from the same point URAPTERYX.

b. Subcostal branches emitted from a footstalk; second and third median branches from nearly the same point. TRISTROPHIS.

* See Trans. Ent. Soc. 1870, p. 486.

† I since find that my example has been followed by other Lepidopterists.

2. First subcostal branch of primaries united to the costal vein by a recurrent spur beyond the end of the cell; the first and second and the third and fourth branches terminating as separate forks from well-defined footstalks.

- a. Subcostal branches of secondaries emitted near together; second and third median branches moderately wide apart.

XEROPTERYX.

3. Subcostal of primaries 5-branched; first branch emitted before the end of the cell, united to the costal by means of a recurrent spur beyond the cell; other veins emitted regularly.

- a. Subcostal branches of secondaries emitted near together; second and third median branches from one point.

aa. Caudal angle of males obtuse; antennæ of males simple.

ÆSCHROPTERYX.

ab. Caudal angle of males acute; antennæ of males strongly pectinated GONORTHUS.

- b. Subcostal branches of secondaries well separated at their origins.

ba. Caudal angle of males acute; antennæ of males finely ciliated (not pectinated) NEPHELOLEUCA.

- c. Secondaries angulated at extremity of first subcostal as well as at third median branch; subcostal branches emitted near together; all the median branches well separated at their origins.

ca. Antennæ of males ciliated THINOPTERYX.

4. First subcostal branch of primaries emitted before the end of the cell, uniting with the costal by means of an abrupt angle; upper radial emitted from the subcostal just beyond the cell; secondaries with only the usual acute angle; the subcostal branches emitted from a footstalk; median branches all well separated at their origins.

- a. Antennæ flattened, simple SIRINOPTERYX.

B. Primaries angulated at extremity of third median branch.

1. Primaries obtusely angulated; subcostal 5-branched; first branch emitted before end of cell, united by a recurrent spur to the costal and to the second branch at some distance beyond the cell; upper radial emitted from the subcostal close beyond the cell.

- a. Subcostals of secondaries emitted from one point at the anterior angle, and second and third medians from the posterior angle of the cell; antennæ of males serrated and penicillated.

RIPULA.

2. Primaries acutely angulated, the margin slightly concave in front of the angle; upper radial widely separated from the subcostal.

- a. Subcostals and medians of secondaries all well separated at their origins; antennæ of males finely pectinated.

GONOGALA.

Obs. It is possible that the last genus in this Table may be more nearly related to *Tetracis* than to *Urapteryx*, although agreeing with the latter in coloration and marking.

URAPTERYX, Leach. (Plate IX. figs. 1, 2.)

This genus requires breaking up, the neuration of the typical group being as follows:—Primaries with the costal vein rather short, terminating at a little beyond the middle of the margin; discoidal cell extending to the middle of the wing or shorter, the subcostal four-branched, the first branch emitted before but close to the end of the cell, united to the costal and separated after a considerable interval; the three others forking from a long foot-stalk beyond the cell; upper radial emitted from the anterior angle of the cell, lower radial dividing the discocellulars unequally, the lower being decidedly longer than the upper; both discocellulars are transverse and concave; second and third median branches emitted together from the end of the cell and far distant from the first branch; submedian vein extending to external angle: secondaries with the costal and subcostal veins closely approximated for some distance from their origin and then somewhat abruptly separating; the subcostal two-branched, the first branch emitted just before the end of the cell, the second from the anterior angle, where it represents the radial of some Moths; discocellular oblique and concave; other veins as in the primaries. In this genus the primaries are triangular, the secondaries irregularly angulated, and with a longer or shorter tail at the extremity of the third median branch*.

The following species are in the British-Museum collection:—

1. URAPTERYX SAMBUCARIA.—*Phalæna-Geometra sambucaria*, *Linn. Syst. Nat.* i. 2. p. 860 (1766).—*Therinia sambucaria*, *Hübner, Verz. bek. Schmett.* p. 290 (1816).—*Urapteryx sambucaria*, *Leach, Zool. Misc.* p. 80, pl. 35. fig. 2 (1814-17).—*Acæna sambucaria*, *Treitschke, Schmett.* vi. i. p. 85 (1827).—Germany and France; England. B.M.

2. URAPTERYX SCITICAUDARIA, *Walker, Cat. Lep. Het.* xxv. p. 1480 (1862).—India, Darjiling. Type B.M.

3. URAPTERYX PICTICAUDATA, *Walker, Cat. Lep. Het.* xx. p. 12 (1860).—N. India, Nepal. B.M.

Originally described from Sarawak. It is closely allied to the

* Some authorities, I believe, are inclined to the opinion of there being a close relationship between *Urapteryx* and *Asthenia*. I believe this view to be wholly erroneous, but in this place will not attempt to discuss the question.

preceding, but longer-winged, clearer, and less striated, with more strongly defined and usually more divergent bands.

4. *URAPTERYX MULTISTRIGARIA*, Walker, *Cat. Lep. Het., Suppl.* v. p. 1535 (1866).—N. India. Type B.M.

5. *URAPTERYX EBULEATA*, Guénée, *Phal.* i. p. 32 (1857).—*U. sambucata*, var., Kollar, *Hügel's Kaschmir*, p. 483 (1848).—*U. kantalaria*, Felder, *Reise der Nov., Lep.* iv. pl. cxxii. fig. 3 (1875).—Darjiling. B.M.

6. *URAPTERYX NIVEA*, sp. n.—♀. Intermediate between *U. ebuleata* and *U. maculicaudaria*; larger than the largest females of the latter species, which it most resembles, and with the form and well-marked acuminate tail of *U. ebuleata*; as in the latter species, the disk of the wings, and especially of the secondaries, is crossed by a band of grey scales much better-defined than in *U. maculicaudaria*, and the spots on each side of the tail of secondaries are reduced to mere black points; the bands are narrower and not so dark as in the last-mentioned species, the inner one somewhat concave, darker and wider apart than in *U. ebuleata*. Expanse of wings 66 millim.—Tokei, Japan. Type B.M.

The form of the wings, small spots above the tail, and somewhat different banding at once distinguish this species from the following; and its much superior size, whiter colouring, darker and more widely placed bands separate it from *U. ebuleata*.

7. *URAPTERYX MACULICAUDARIA*.—*Acæna maculicaudaria*, Motschulsky, *Bull. Mosc.* 1866, p. 196.—♀ *Urapteryx luteiceps*, Felder, *Reise der Nov., Lep.* iv. pl. cxxii. fig. 2 (1875).—Yokohama, Tokei, Hakodaté, Chekiang. B.M.

8. *URAPTERYX CLARA*, Butler, *Ann. & Mag. Nat. Hist.* ser. 5, vol. vi. p. 120 (1880).—N.E. Himalayas. Type B.M.

9. *URAPTERYX PODALIRIATA*, Guénée, *Phal.* i. p. 32. n. 8 (1857).—Silhet, Moulmein, Java. B.M.

TRISTROPHIS, gen. nov. (Plate IX. figs. 3, 4.)

Form of *Urapteryx maculicaudaria*, but at once distinguishable from typical *Urapteryx* by the neururation of the secondaries, the subcostal branches being emitted from a short footstalk, and the

second and third median branches separated at their origins, instead of being emitted from the same point. Type *T. veneris*.

1. TRISTROPHIS VENERIS.—*Urapteryx veneris*, *Butler, Ann. & Mag. Nat. Hist.* ser. 5, vol. i. p. 392 (1878); *Ill. Typ. Lep. Het.* iii. p. 29, pl. xlvi. fig. 1 (1879).—Yokohama, Tokei. Type B.M.

There are one or two species somewhat resembling this described from South America—*U. saturniaria*, Herr.-Sch., *U. platinata*, Guén., and *U. quadrifilata*, Felder; but I have had no opportunity of examining them, and the markings on their secondaries incline me to refer them provisionally to *Byssodes*.

GONORTHUS, gen. nov. (Plate IX. figs. 9, 10.)

Differs from *Urapteryx* in the form of the wings—the primaries having an acute apex and straight outer margin; the secondaries with rectangular outer margin, the angle being acutely produced, but not preceded by a short angle as in the two foregoing genera; discocellular of secondaries almost straight and transverse. Type *G. flavifimbria*. The typical species is wonderfully like *Micronia* excepting in neuration.

1. GONORTHUS FLAVIFIMBRIA.—*Urapteryx flavifimbria*, *Walker, Cat. Lep. Het.* xx. p. 8 (1860).—Jamaica, St. Domingo. Type B.M.

Urapteryx tesserata and *U. breviararia* of Guénée and Hübner should probably be placed here, so far as I can judge from Hübner's figure.

RIPULA, Guénée. (Plate IX. figs. 17, 18.)

Differs from *Gonorthus*, to which it is nearly allied, in its less strongly pectinated antennæ in the male, the subangulated outer margin of the primaries, and narrower discoidal cell with inangled discocellular veinlet to the secondaries. Type *R. mahometaria*.

1. RIPULA MAHOMETARIA.—*Geometra mahometaria*, *Herrich-Schäffer, Aussereurop. Schmett.* figs. 69, 70 (1850–58).—*Ripula mexicaria*, *Guénée, Phal.* i. p. 35 (1857).—Bolivia and Mexico. B.M.

M. Guénée described his *G. mexicaria* from a single female

example, which is represented exactly by one of our Mexican specimens; it is hardly sufficiently distinct to be worthy of mention as a variety, since it only differs in variable characters.

2. *RIPULA AREA*.—*Phalæna-Geometra area*, *Cramer, Pap. Exot.* i. p. 88, pl. 56, D (1779).—*Phalæna-Geometra areata*, *Fabr. Sp. Ins.* ii. p. 256.—*Calospilos arearia*, *Hübner, Verz. bek. Schmett.* p. 305 (1816).—*Urapteryx areata*, *Guénée, Phal.* i. p. 34 (1857).—Rio Jurua, Amazons. ♀ M.

SIRINOPTERYX, gen. nov. (Plate IX. figs. 15, 16.)

Allied to *Gonorthus* and *Tristrophis*, with the form of wings nearly as in the former, but the neuration of the latter; the antennæ of the male thickened but not pectinated. Type *S. rufivinctata*.

1. *SIRINOPTERYX RUFIVINCTATA*.—*Urapteryx rufivinctata*, *Walker, Cat. Lep. Het.* xxvi. p. 1747 (1862).—Darjiling and Shillong. B.M.

GONOGALA, Butler. (Plate IX. figs. 19, 20.)

Primaries angulated at extremity of third median branch; discocellulars angulated; the lower radial emitted from the centre of the discocellulars; second and third median branches separated at their origins: secondaries with an acute angle at extremity of third median branch; first subcostal branch emitted before the end of the cell; discocellular veinlet concave; second and third median branches emitted separately as in the primaries: antennæ pectinated, with the pectinations well separated. Type *G. lactea*.

1. *GONOGALA LACTEA*, *Butler, Trans. Ent. Soc. London*, 1882, p. 341.—Chili. Type B.M.

NEPHELOLEUCA, gen. nov. (Plate IX. figs. 11, 12.)

Form of *Gonorthus*, and with very similar neuration, excepting that the subcostal branches of the secondaries are not emitted quite at the same point, that the second and third median branches are also separated by a short space at their origins, and that the radial is very oblique and subangulated towards the anterior angle of the cell: antennæ very different, not pectinated in the male, but with fine short cilia along the anterior margin. Type *N. politia*.

1. *NEPHELOLEUCA POLITIA*.—*Phalæna politia*, *Cramer, Pap. Exot.* ii. p. 65, pl. 140, E (1779).—*Phalæna-Geometra politata*, *Fabricius, Sp. Ins.* ii. p. 253.—*Eulepidotis politaria*, *Hübner, Verz. bek. Schmett.* p. 291 (1816).—*Urapteryx politia*, *Leach, Zool. Misc.* i. p. 80, pl. 35. f. 1 (1814–17).—*Urapteryx complicata*, *Guénéé, Phal.* i. p. 30, pl. 6. fig. 9 (1857).—St. Domingo, Jamaica; Sarayacu and Oaxaca, Mexico. B.M.

Guénéé's *Urapteryx complicata* is represented by full-sized examples of the species; the smaller specimens are frequently less fully marked with reddish. The *U. illitirata* of Guénéé is apparently distinct; the costal spot of primaries is said to be bilobed. It is possible, however, that this may be only an exaggeration of a character frequently found in *Nepheleleuca politia*, this spot being in many specimens deeply indented externally.

THINOPTERYX, gen. nov. (Plate IX. figs. 13, 14.)

Primaries triangular, with acute prominent apex; second subcostal with its three branches emitted before the end of the cell; lower radial emitted from the centre of the discocellulars; discocellulars forming a concave transverse line; second and third median branches well separated at their origins: secondaries with two distinct angles—the first at the extremity of the first subcostal branch, the second, which forms a short tail, at the extremity of the third median branch as usual; subcostal and second and third medians separate at their origins; the discocellular oblique and slightly concave: antennæ ciliated, not pectinated. Type *T. crocopterata*.

1. *THINOPTERYX CROCOPTERATA*.—*Urapteryx crocopterata*, *Kollar in Hügel's Kaschmir*, p. 483 (1848).—Silhet, Nepal, Andamans, Java. B.M.

2. *THINOPTERYX PRÆTORARIA*.—♀ *Urapteryx prætoraria*, *Felder, Reise der Nov., Lep.* iv. pl. cxxii. fig. 13 (1875).—Silhet. ♂, B.M.

3. *THINOPTERYX STRIOLATA*, sp. n.—Near to *T. crocopterata*, but differing constantly in the considerably darker costal border of primaries, the more distinctly striated upper surface, which gives it a mottled appearance, the more widely separated and more parallel bands across the primaries, the outer band distinctly wider, and the more densely grey-mottled character of

the secondaries, especially beyond the middle. Expanse of wings 68–73 millim.—Yokohama, Tokei, Nikko. Type B.M. This species represents *T. crocopterata* in Japan.

4. *THINOPTERYX NEBULOSA*, sp. n.—Near to *T. delectans* but larger; the markings, and especially the external borders, mottled with orange; the yellow spots on the primaries forming a less distinct band and less central; there are also two blackish lines across these wings as in *T. crocopterata*, but less strongly defined, and the discocellulars are dark; the disk of the secondaries is always crossed by a more or less defined curved series of orange spots, and the border is interrupted by a blackish patch extending into the tail. Expanse of wings 69–71 millim.—E. India, Silhet. Type B.M.

This species evidently represents *T. delectans* in India. It was regarded by Kollar as a variety of *T. crocopterata*. It seems to me, however, to come decidedly closer to *T. prætoraria*. Of course it is possible, although hardly probable, that the three are forms of a trimorphic species. They are all represented in both sexes.

5. *THINOPTERYX DELECTANS*.—*Urapteryx delectans*, *Butler*, *Ill. Typ. Lep. Het.* ii. p. 45, pl. xxxv. fig. 2 (1878).—Yokohama, Tokei, North China. Type B.M.

XEROPTERYX, gen. nov. (Plate IX. figs. 5, 6.)

This genus is so distinct from *Urapteryx* in neuration, that I feel some hesitation in placing it here, the subcostal having five branches, all being given off from a long footstalk emitted before the end of the cell—the first and second upon a separate stem emitted from the main footstalk at less than a third the distance between the cell and the apex; the third and fourth forming a short apical costal fork; the fifth emitted from below the main stem soon after the emission of the two first branches: lower radial emitted from the centre of the discocellulars, which form an uneven concave line; second and third median branches emitted separately: neuration of secondaries as in the preceding genus; form of wings also very similar, but without the second angulation of the secondaries: antennæ of male ciliated.

1. *XEROPTERYX COLUMBICOLA*.—*Urapteryx columbicola*, *Walker*, *Cat. Lep. Het.* xx. p. 11 (1860).—India, Darjiling. Type B.M.

2. *XEROPTERYX SIMPLICIOR*, sp. n.—Brownish grey, transversely striated with darker grey; costal borders, fringes, and the outer margin of secondaries white; the latter wings with a diffused longitudinal reddish nebula above the tail; a black spot on each side of the tail: wings below white, with black markings as in *X. columbicola*. Expanse of wings 58 millim.—Sarawak, Borneo. Type B.M.

Chiefly differs from *X. columbicola* in the absence of the large sulphur-yellow spot and crescent upon the primaries.

ÆSCHROPTERYX, gen. nov. (Plate IX. figs. 7, 8.)

Form of *Gonorthus*; neuration nearly as in *Urapteryx*, but the antennæ of the male simple. Type *Æ. tetragonata*.—*Chærodes*, Guénéé (preoccupied in Coleoptera).

1. *ÆSCHROPTERYX TETRAGONATA*.—*Chærodes tetragonata*, Guénéé, *Phal.* i. p. 36, pl. 8. fig. 1 (1857).—*C. bifiliaria*, Felder, *Reise der Nov.*, *Lep.* iv. pl. cxxii. fig. 1 (1875).—♂, Venezuela, Quito. B.M.

2. *ÆSCHROPTERYX TRANSPECTANS*.—*Chærodes transpectans*, Walker, *Cat. Lep. Het.* xx. p. 22 (1860).—♀, Venezuela. Type B.M.

The following species also belong to the genus:—*Chærodes sectata* and *C. invisata* of Guénéé, *C. striata* of Stoll, and *C. invariaria* of Walker. This genus concludes the true *Urapterygiæ*.

EXPLANATION OF PLATE IX.

Diagrammatic representations of the neuration and ♂ antennæ of the genera of *Urapterygiæ*.

Fig. 1.	Neuration of <i>Urapteryx</i> .	2.	Antenna of male.
3.	„ <i>Tristrophis</i> .	4.	„
5.	„ <i>Xerapteryx</i> .	6, 6a.	„
7.	„ <i>Æschropteryx</i> .	8.	„
9.	„ <i>Gonorthus</i> .	10.	„
11.	„ <i>Nepheloleuca</i> .	12.	„
13.	„ <i>Thinopteryx</i> .	14.	„
15.	„ <i>Sirinopteryx</i> .	16.	„
17.	„ <i>Ripula</i> .	18.	„
19.	„ <i>Gonogala</i> .	20, 20a.	„

